

WHAT IS CLAIMED IS:

1. An ADSL modem apparatus comprising:
an exchange unit that transmits and receives a communication distance detecting
5 signal, the signal detecting a communication distance to an opposing ADSL modem
apparatus during an initialization sequence according to one of the ITU-T standard
G.992.1 and G.992.2, the signal further having comb-shaped frequency characteristics;
and
a estimation unit that estimates the communication distance to the opposing ADSL
10 modem apparatus according to a reception level of the communication distance detecting
signal.
2. The ADSL modem apparatus according to claim 1, wherein the
communication distance detecting signal is transmitted and received prior to a
transmission of a REVERB signal, the REVERB signal being in accordance with one of
15 the ITU-T standard G.992.1 and G.992.2.
3. The ADSL modem apparatus according to claim 1, wherein said estimation
unit estimates the communication distance to the opposing ADSL modem apparatus by
comparing reception levels of two carriers, the carriers being selected from a plurality of
carriers that configure the communication distance detecting signal.
- 20 4. The ADSL modem apparatus according to claim 1, further comprising:
a communication unit that communicates by concentrating signal energy into a
low frequency band, the signal energy being assigned to a transmission signal according
to the communication distance estimated by said estimation unit.
5. The ADSL modem apparatus according to claim 4, wherein said
25 communication unit minimizes the signal energy assigned to a high frequency band and
increases the signal energy assigned to the low frequency band, when the communication
distance to the opposing ADSL modem apparatus is increased.
6. The ADSL modem apparatus according to claim 1, wherein the ADSL
modem apparatus is located at a remote side, and wherein the communication distance

between the remote side ADSL modem apparatus and a center side ADSL modem apparatus is estimated.

7. The ADSL modem apparatus according to claim 1, wherein the ADSL modem apparatus is located at a center side, and wherein the communication distance
5 between the center side ADSL modem apparatus and a remote side ADSL modem apparatus is estimated.

8. A communication method for an ADSL modem apparatus, the method comprising:

receiving a communication distance detecting signal, the signal detecting a
10 communication distance to an opposing ADSL modem apparatus during an initialization sequence according to one of the ITU-T standard G.992.1 and G.992.2, the signal further having comb-shaped frequency characteristics;

estimating the communication distance to the opposing ADSL modem apparatus according to a reception level of the communication distance detecting signal; and
15 concentrating signal energy into a low frequency band, the signal energy being assigned to a transmission signal according to the estimated communication distance.

9. The communication method for an ADSL modem apparatus according to claim 8, the method further comprising:

minimizing the signal energy assigned to a high frequency band and increasing the
20 signal energy assigned to the low frequency band, when the communication distance to the opposing ADSL modem apparatus is increased.